October 6, 2005

Ben Baker
Project Manager
Michigan Operations
47 Bldg.
Midway, MI 48667

SUBJECT: AMENDMENT NO. 12 TO SOURCE MATERIAL LICENSE NO. STB-527 AUTHORIZING THE INCORPORATION OF CHANGES TO LICENSE CONDITIONS AND CHANGES TO THE DECOMMISSIONING PLAN (DP) FOR THE DOW CHEMICAL COMPANY (TDCC) BAY CITY MI, SITE INTO THE LICENSE (TAC NO. L60463)

Dear Mr. Baker:

I am responding to the Dow Chemical Company (TDCC)'s request for the Nuclear Regulatory Commission (NRC) to incorporate Revision 2 of the Supplement to the Decommissioning Plan (DP) and Revision 3 of the Radiological Health and Safety Plan (RHSP) for the Bay City site into Source Materials License No. STB-52. In a letter dated August 17, 2001, TDCC submitted a supplement to the DP for the Bay City site. Subsequently, TDCC submitted revisions to the supplement on January 31, 2002, (Revision 0), on December 8, 2003, (Revision 1) and on April 13, 2005, (Revision 2). On May 6, 2005, the licensee requested that the license be amended to incorporate Revision 3 of the RHSP into the license.

The license is amended to include Revision 2 of the Supplement to the DP and Revision 3 of the RHSP. The NRC staff evaluated TDCC's requests and developed an Environmental Assessment (EA) (ML051660420) to support the review of TDCC's proposed license amendment request in accordance with the requirements of 10 CFR Part 51. Based on the staff's evaluation, the conclusion of the EA is a Finding of No Significant Impact on human health and the environment for the proposed licensing action. A Safety Evaluation Report was also prepared for this licensing action and is included as an enclosure.

Enclosed is License No. STB-527, Amendment No. 12, authorizing the possession and use of materials during decommissioning to support termination of the license and release of the Bay City site for unrestricted use. The authorized use under this license is changed to read:

9. Authorized use:

   Licensed material shall be possessed and used during site activities leading to its removal from the Bay City site in accordance with the statements, representations, and procedures contained in the amendment request dated October 12, 1995; and the supplemental information submitted December 6, 1995; March 11, 1996; May 24, 1996, and April 13, 2005.

No other use of radioactive materials is authorized under the current license amendment. License condition 13 is deleted from the license and license conditions 12A, 12B, 13A and 13B have been revised. All other license conditions shall remain the same.

If you have any questions, please contact David Nelson, of my staff, at (301) 415-6626.

Sincerely,

/RA/

Daniel M. Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

Docket No.: 040-00017
License No.: STB-527

Enclosures:
1. Safety Evaluation Report
2. Amendment No.12 to License STB-527

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DOCKET NO: 040-00017

LICENSE NO.: STB-527

FACILITY: THE DOW CHEMICAL COMPANY, BAY CITY, MICHIGAN, SITE

SUBJECT: SAFETY EVALUATION REPORT FOR FOR ISSUANCE OF AMENDMENT NO. 12 TO MATERIALS LICENSE NO. STB-527, THE DOW CHEMICAL COMPANY, BAY CITY, MI SITE (TAC #L52656)

1. EXECUTIVE SUMMARY

In a letter dated April 13, 2005, the DOW Chemical Company (TDCC) submitted a request to amend its Source Material License STB-527 to incorporate Revision 2 of the Supplement to the Decommissioning Plan (DP), and a Ground Water Monitoring Plan for Bay City site. In a letter dated May 6, 2005, TDCC requested, that the license also be amended to incorporate Revision 3 of the Radiological Health and Safety Plan (RHSP). TDCC's decommissioning objective is release of the Bay City site for unrestricted use as defined in Subpart E to 10 Code of Federal Regulations (CFR) Part 20. The release criteria for the site is defined in Section 3.0 of Revision 2 of the Supplement of the DP entitled “Unrestricted Use Criteria," the Environmental Assessment (EA) for Amendment 7 of License No. STB-527 (ML051660420), and Attachment 1 to Revision 2 of the Supplement to the DP. The release criteria is the basis for demonstrating that the site can be released for unrestricted use.

The staff reviewed the Safety Evaluation Reports (SERs) for Amendment 7, regarding site decommissioning criteria and the final survey plan, and the original Health and Safety Plan. The SER for Amendment 7 specifically addressed site soil and surface release criteria. The SER for the original Health and Safety Plan specifically addressed the site safety management and organization, the radiation safety program, the as low as reasonablely achievable policy, non-radiological occupational hazards, work area control, decontamination and waste disposal, emergency planning, radiological monitoring, instrumentation, personnel monitoring, air sampling, and ground water monitoring. Both SERs concluded that the proposed actions in the amendment requests did not present an undue risk to workers, the public, or the environment.

This SER documents the staff's evaluation of TDCC’s current amendment request. The staff assessed the proposed actions of the request to determine whether they present risks to workers, the public, or the environment, and whether those risks had been evaluated in the previous SERs. This SER has been prepared in conjunction with an environmental assessment (see ADAMS ML051660420) which evaluates the potential environmental impacts associated with this action. The EA was published in the *Federal Register* on July 25, 2005 (70 FR 52595).

The changes proposed by the licensee in Revision 2 of the Supplement to the DP include allowing the licensee to use an alternate method for conducting radiological surveys and analyzing survey data at its Bay City, MI site, and adding four temporary structures and two small pieces of land located adjacent to the property to the scope of decommissioning activities. The changes in Revision 3 of the RHSP include minor revisions to the text, clarification of procedures, and modifications to site maps. Groundwater monitoring has been ongoing at the

Dow site. Incorporation of the Groundwater Monitoring Plan for the Bay City site into the license formally commits the licensee to a groundwater monitoring program.

2. FACILITY OPERATING HISTORY

The radioactive material at the Bay City, Michigan, site consists primarily of foundry slag containing low-levels of thorium. This material was produced in the period from 1940 to 1970 as the residual material from the production of magnesium thorium alloy. This lightweight alloy was used for defense purposes, including aircraft engines and aeronautical structural components. The slag was originally stored in piles at this site (Bay City) and a site in Midland, Michigan. Some other thorium-contaminated material from a decommissioned third site was added to the Bay City pile in 1985.

A single license (STB-527) was originally granted by the U.S. Nuclear Regulatory Commission (NRC) in 1973 for the Bay City and Midland sites to store up to 200,000 pounds of thorium as slag. In 1997, the license was amended to approve the decommissioning criteria and final survey plan for both sites. This license expired in 1978, but has remained in effect under timely renewal. The Midland site was subsequently verified to be adequately decommissioned and released from the license. After the remediation of the majority of the stockpiled surface material at the Bay City site, Dow discovered that there was significant volume of contaminated material below the water table, in the saturated zone. Revision 2 of the Supplement to the DP addresses the contaminated material in the subsurface saturated zone. Attachment 1 of Revision 2 to the Supplement addresses potentially contaminated surfaces on four temporary structures on site, and surface soil contamination within two small pieces of land located adjacent to the site. The staff has reviewed the information in the Supplement according to the Consolidated Nuclear Material Safety and Safeguards (NMSS) Decommissioning Guidance, NUREG-1757, Volume 1, Revision 1, Section 16.2 (Facility Operating History). Based on this review, NRC staff has determined that there is sufficient information to determine if the addition of the four buildings and small plots of land to the scope of decommissioning present an additional risk to workers, the public, or the environment and whether those risks had been evaluated in the previous SERs.

3. FACILITY DESCRIPTION

The NRC staff has reviewed the information in Attachment 1 to the April 13, 2005, letter, entitled "Ground Water Monitoring Plan for Thorad Site, TDCC, Bay City, Michigan", Section 1.0 of Revision 2 of the Supplement to the DP, titled “General Information”, and in Attachment 1 to Revision 2 of the Supplement to the DP titled “Final Status Survey Plan for Rail Car Loading Area, and Support Zone Soil, Temporary Office/Laboratory Building, Personnel Contamination Facility Building, and Rail Loading Area Support Trailer" according to the Consolidated NMSS Decommissioning Guidance, NUREG-1757, Volume 1, Revision 1, Section 16.3 (Facility Description). The Bay City site's location, description, history, ownership, boundaries, surrounding areas, and radiological and environmental site characteristics and status are described in Section 1.0 of the Supplement, Attachment 1 to the Supplement, and Attachment 1 to the April 13, 2005, letter. Based on this review, NRC staff has determined that the licensee has provided sufficient information to aid the NRC in evaluating the licensee's determination of the radiological status of the facility and the licensee's planned decommissioning activities.

4. RADIOLOGICAL STATUS OF FACILITY

The NRC staff has reviewed the information in Section 1.0 of Revision 2 of the DP, entitled "General Information" and in Section 5.0 of Revision 3.0 of the RHSP, entitled "Background Information", according to the Consolidated NMSS Decommissioning Guidance, NUREG-1757, Volume 1, Revision 1, Section 16.4 (Facility Radiological Status). Based on this review, NRC staff has determined that the licensee has adequately described the types and activites of radioactive material contamination at its site to allow the NRC staff to evaluate the potential safety issues associated with remediating the facility, the appropriateness of the remediation activities and radiation control measures proposed by the licensee relative to the type of radioactive material present at the site, the appropriateness of licensee's waste management practices, and the adequacy of the licensee's cost estimates.

5. SOIL AND SURFACE RELEASE CRITERIA

The NRC staff has reviewed the information regarding soil release criteria in Section 3.0 of Revision 2 of the Supplement of the DP entitled "Unrestricted Use Criteria", in Attachment 1 of Revision 2 of the Supplement to the DP entitled "FSS Plan for Rail Car Loading Area, and Support Zone Soil, Temporary Office/Laboratory Building, Personnel Contamination Facility Building, and Rail Loading Area Support Trailer," and in the Environmental Assessment for Amendment 7 of License No. STB-527 (ML051660420). The staff concludes that the soil release criteria is reasonable and appropriate.

TDCC used the guidance in NRC Policy and Guidance Directive FC 83-23, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," and Regulatory Guide 1.86 to establish unrestricted use criteria for the building surfaces. Discussions regarding the criteria are found in the EA for License Amendment 7 and Attachment 1 of Revision 2 of the Supplement to the DP entitled "FSS Plan for Rail Car Loading Area, and Support Zone Soil, Temporary Office/Laboratory Building, Personnel Contamination Facility Building, and Rail Loading Area Support Trailer." The staff concludes that the building and equipment surfaces release criteria are reasonable and appropriate.

6. CHARACTERIZATION AND FINAL STATUS SURVEYS

The NRC staff has reviewed the information regarding the surveying and averaging criteria methodology in Revision 2 to the Supplement of the DP according to the Consolidated NMSS Decommissioning Guidance, NUREG-1757, Volume 2, Revision 1, Section 4.2 (Characterization surveys) and Section 4.4 (Final Status Survey Design). Based on this review, the NRC staff has determined that the use of the method proposed by the licensee for conducting characterization and final status surveys and averaging the survey data would not result in an increased danger to remediation workers and significant quantities of residual radioactivity being undetected.

7. STATE CONSULTATION

The Michigan Department of Environmental Quality was notified of the licensee's amendment request and had no comments on the proposed action.

8. CONCLUSIONS

Based on the considerations discussed above, the NRC staff concludes that TDCC's amendment request does not present any additional risks to workers, the public, or the environment relative to the risks evaluated in the previous SERs. The staff concludes that there continues to be reasonable assurance that the health and safety of the public will not be endangered by the proposed actions in the amendment request and such actions will be conducted in compliance with NRC regulations.

9. REFERENCES

- Nuclear Regulatory Commission, "Issuance of License Amendment to the Dow Chemical Company to Approve the Decommissioning Criteria and Final Survey Plan for the Decommissioning of Thorium Contaminated Slag Storage Piles at the Dow Chemical Company's Sites in Midland and Bay City, Michigan" July 21, 1997, ADAMS ML050750212.

- Nuclear Regulatory Commission, "Approval of Health and Safety Plan Dated January 2001, and Amendment of the Dow Chemical Company License (TAC#L60463)" March 6, 2002, ADAMS ML010660207.

- The Dow Chemical Company, "Revised RAIs [[Request for Additional Information]] and Revision 2 of Supplement to the Decommissioning Plan for the TDCC Bay City, MI, Site" April 13, 2005, ADAMS ML051040383.

- Nuclear Regulatory Commission, "Revised Radiological Health and Safety Plan for the TDCC Bay City, MI, Site" May 6, 2005, ADAMS ML0512900296.

- Nuclear Regulatory Commission, Method for Surveying and Averaging Concentrations of Thorium in Contaminated Subsurface Soil, February 1997.

- NUREG-5849, Manual for Conducting Radiological Surveys in Support of License Termination, June 1992.

- NUREG-1757, Volume 1, Rev. 1, Consolidated NMSS Decommissioning Guidance, Decommissioning Process for Materials Licensees, Final Report, September 2003.

- Title 10 Code of Federal Regulations, Part 20, Subpart E, "Radiological Criteria for License Termination".

- Title 10, Code of Federal Regulations, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions".

ENCLOSURE 2
Amendment No.12 to License STB-527

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 12

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. The Dow Chemical Co.	3. License number STB-527 Is amended in its entirety to read as follows:
2. 2020 Dow Center Midland, MI 48674	4. Expiration date: August 31, 2009
	5. Docket No. 040-00017

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Thorium	A. Contaminated soil, sludge, sediment, trash, building rubble, structures, and any other contaminated materials.	A. All residual contamination which exists at Dow's Bay City, MI, site

9. Authorized use:

Licensed material shall be possessed and used during site activities leading to its removal from the Bay City site in accordance with the statements, representations, and procedures contained in the amendment request dated October 12, 1995; and the supplemental information submitted December 6, 1995; March 11, 1996; May 24, 1996, and April 13, 2005.

CONDITIONS

10. Authorized Place of use: The existing Dow site in Bay City, MI.

11.A. Licensed materials shall be kept under the supervision of the Radiation Safety Officer, who shall have the following education, training, and experience:

1. Education: A bachelor's degree in the physical sciences, industrial hygiene, or engineering from an accredited college or university or an equivalent of training and relevant experience in radiological protection. Two years of relevant experience are generally equivalent to one year of academic study.

2. Health physics experience: At least one year of work experience in applied health physics, industrial hygiene, or similar work relevant to radiological hazards associated with site remediation. This experience should involve actually working with radiation detection and measurement equipment, not strictly administrative or "desk" work.

3. Specialized knowledge: A thorough knowledge of the proper application and use of all health physics equipment under for thorium and its daughters, the chemical and analytical procedures used for radiological sampling and monitoring methodologies used to calculate personnel exposure to thorium and its daughters, and a thorough understanding of how thorium was used at the location and how the hazards are generated and controlled.

11B. The licensee, without prior NRC approval, may appoint a Radiation Safety Officer provided: a) the licensee maintains documentation demonstrating that the requirements of condition 11A are met; and b) the NRC is informed of the name of the new Radiation Safety Officer by letter to the Regional Administrator, [Region III], within 30 days of the appointment.

12A. The Dow Chemical Company shall conduct the final survey of the Bay City site in accordance with the final survey plans submitted by letters dated October 12, 1993; December 6, 1995; March 11, 1996; March 31, 1997 and April 13, 2005.

12B. The Dow Chemical Company shall use the release criteria for surfaces and soil established in submittals of March 11, 1996, and April 13, 2005.

13A. The Dow Chemical Company shall conduct ground water monitoring at the Bay City site in accordance with the Ground Water Monitoring Plan for Thorad Site, TDCC, dated April 13, 2005.

13B. The radiological health and safety issues during decommissioning at the Bay City site by the Dow Chemical Company shall be governed by the Radiological Health and Safety Plan dated May 6, 2005 (Revision 3).

For the U.S. Nuclear Regulatory Commission

Date _____10/6/05_____

By: _____**/RA/**_____
Daniel M. Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards